

Risk Management Practices

*Managing climate-related risks to tilapia cage farming*

All farmers know that farming fish involves risks. Reducing and properly managing risks are very important to profits and sustainability. This note summarizes what the AQUADAPT project has learnt from experienced farmers, officials and researchers about effective ways to manage climate-related risks in river-based cage aquaculture.

Climate-related risks include things like the differences among seasons and places in average

weather as well as extreme events like floods, droughts, or rapid changes in hot or cold weather.

Our belief is that better managing risks under current climate is an important strategy for building capacities to adapt to climate change.

Farmers are clear that climate related risks must be managed alongside other even more important short-term risks to profits such as disease or problems with key inputs like feed price or fish stock (Table 1).

To manage climate related-risks three important strategies are site selection, reducing stocking densities and improved disease management. Selecting appropriate sites for cage culture is important but greatly constrained by their availability.

Table 1: Level of concern about different types of risks to farm profitability. Averages scores of 662 fish farmers on a scale of 1 (unconcerned) to 5 (very concerned)

FACTOR	MEAN
disease outbreak	4.65
feed price	4.41
Low quality stock	4.35
drought / low flows	4.21
polluted water	4.19
Fish sale price	4.18
flooding / fast flows	3.89
Low quality feed	3.73
Cage Damage from river flow	3.66

“Appropriate cage site selection will help reduce lots of risks”

Prom Krutnoi, Uttaradit



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Figure 1 summarizes farmers views on the most important risk management practices at the farm and river level. At the farm level this includes managing quality of inputs and maintaining good relations. At the river level a lot of importance is given to how water infrastructure is managed and controlling polluted run-off from the watershed.

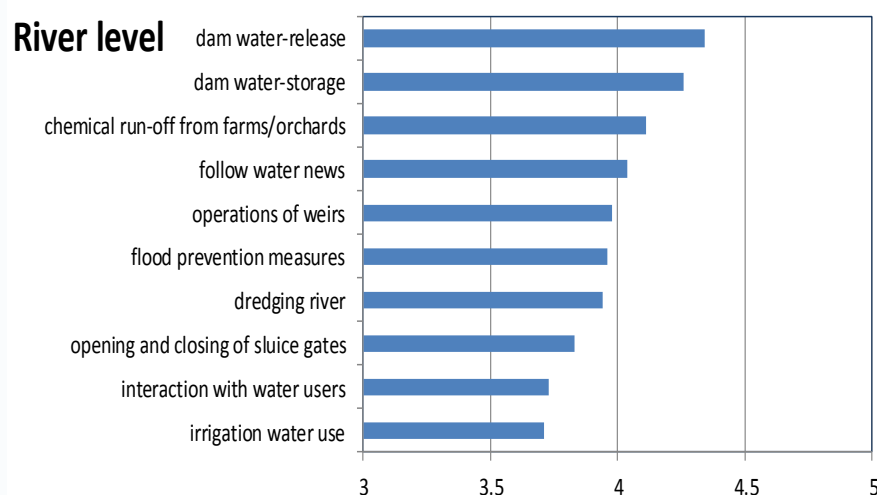
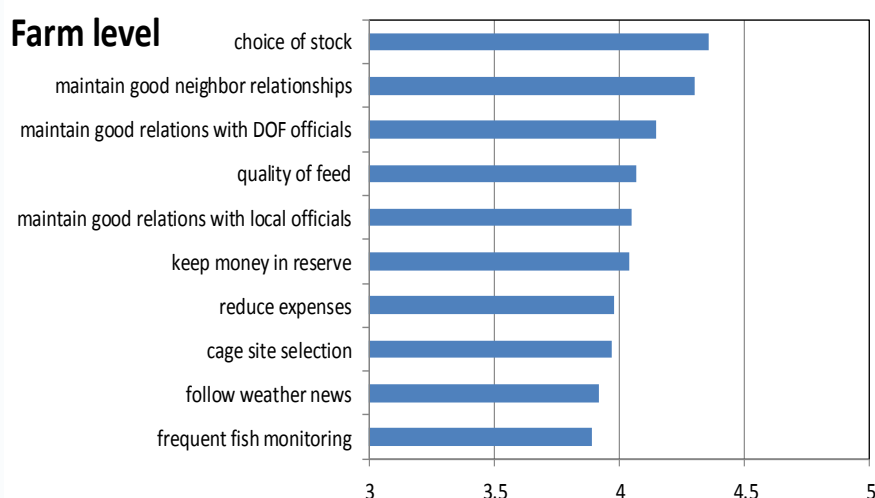
Farmers and experts emphasize paying attention to water depth as well as having space to move cages temporarily in event of high flood flows. Frequent monitoring is important during periods of extreme low or high flows.

Figure 1: Risk Management Practices of fish cage farmers



Fish disease is an important risk at all times of the year and risks appear to be affected by many factors not just weather or climate. Nevertheless, good management practices help reduce risks when flow and climate conditions are stressful for fish. Keeping well-informed about disease epidemics upstream and in the culture area is important. Sick, diseased, and dead fish should be immediately removed, but not disposed into the river or pathogens may be spread to other fish and cages. Cage mesh should be cleaned so do not clog so fish wastes can exit quickly and high dissolved oxygen levels maintained.

Many fish farmers have begun to adapt their culture methods to cope with climate uncertainty by adjusting stocking calendars, maintaining different cohorts, trying different species, and by avoiding very high stocking densities. Stocking with larger, stronger, fish reduces vulnerability and time at risk in river cages. Aeration and fish immunostimulant including vitamin application can help improve fish health. In some locations excavation to deepen river during periods of very low flows can temporarily help deal with extreme conditions.



“Fish cages are moved to deeper channels in the middle of rivers during low flows and towards the riverbank during floods”

Tiemta Kuntaros, Chiang Mai

Reducing stocking densities at high-risk times is an important management tool as it reduces stress to fish making them less vulnerable to extreme climate conditions. In low flow conditions supplementary aeration or water circulation helps reduce risks from low dissolved oxygen levels.